ANBCA 2

# Analytical Biochemistry

## An International Journal

EDITOR: *Alvin Nason*

ADVISORY BOARD:

*Gary Ackers*
*Norman G. Anderson*
*Eraldo Antonini*
*Gilbert Ashwell*
*Samuel P. Bessman*
*Simon Black*
*Robert M. Bock*
*Robert L. Bowman*
*Ludwig Brand*
*A. E. Braunstein*
*Melvin Calvin*
*Andreas Chrambach*
*Sidney Colowick*
*Frank Eisenberg, Jr.*
*Jacques R. Fresco*
*Victor Ginsburg*
*I. C. Gunsalus*
*Harlyn O. Halvorson*
*William Z. Hassid*
*Osamu Hayaishi*
*Edward C. Heath*
*Leslie Hellerman*
*C. H. W. Hirs*
*Evan C. Horning*
*Rollin D. Hotchkiss*
*Walter L. Hughes*
*William B. Jakoby*
*Ephraim Katchalski*
*Irving Klotz*
*Luis F. Leloir*
*Olov Lindberg*
*Feodor Lynen*
*Brian J. McCarthy*
*Vincent Massey*
*Manfred M. Mayer*
*Alan H. Mehler*
*Bruce Merrifield*
*Marshall Nirenberg*
*Kazuo Okunuki*
*Alexander Rich*
*Gerhard Schmidt*
*Michael Sela*
*Herbert A. Sober*
*Sol Spiegelman*
*Paul K. Stumpf*
*Charles A. Thomas, Jr.*
*Sidney Udenfriend*
*Bert L. Vallee*
*Samuel B. Weiss*
*Theodor Wieland*
*George Wolf*
*W. A. Wood*
*Lemuel D. Wright*
*David A. Yphantis*

VOLUME 52
1973

ACADEMIC PRESS
*New York and London*

Copyright © 1973 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form, or by any means, electronic or mechanical, including photocopy, recording, or any information storage retrieval system, without permission in writing from the copyright owner.

## CONTENTS OF VOLUME 52

### Number 1, March 1973


B. L. Fletcher, C. J. Dillard, and A. L. Tappel. Measurement of Fluorescent Lipid Peroxidation Products in Biological Systems and Tissues . . . . . 1

David Rodbard and George Weiss. Mathematical Theory of Immunoradiometric (Labeled Antibody) Assays. . . . . 10

Arved Datyner and Elizabeth Finnimore. A New Staining Method for the Assay of Proteins on Polyacrylamide Gels . . 45

Oscar A. Scornik. Improved Sucrose Gradient Analysis of Mouse Liver Polyribosomes . . . . . 56

Gary H. Zeman, Philip Z. Sobocinski, and Raymond L. Chaput. An Automated $P_{CO_2}$ Assay for Glutamic Acid Decarboxylase . 63

Bertil Karlmark. The Determination of Titratable Acid and Ammonium Ions in Picomole Amounts . . . . . 69

Sumner M. Kalman, Gunter Barth, Robert E. Linder, Edward Bunnenberg, and Carl Djerassi. Magnetic Circular Dichroism Spectroscopy. A Definitive Method for the Determination of Urinary Porphyrins . . . . . 83

David Racusen. Stoichiometry of the Amido Black Reaction with Proteins . . . . . 96

D. M. Kaplan and D. O. Woodward. Evaluation of Applicability of Tryptic Peptide Maps for "Finger Printing" Mitochondrial Membrane Protein Preparations . . . . . 102

Jack S. Wolpert and Mary Lou Ernst-Fonberg. Hydroxamate Assay Quantitation of Ligands Covalently Bound to Affinity Chromatography Gels . . . . . 111

D. C. M. Luk, P. Bartl, and A. L. Nussbaum. Chain Length Characterization of Oligodeoxyribonucleotides by Analytical Ultracentrifugation . . . . . 118

M. S. Rohrbach, B. A. Humphries, F. J. Yost, Jr., W. G. Rhodes, S. Boatman, R. G. Hiskey, and J. H. Harrison. The Reaction of 4,4′-bis-Dimethylaminodiphenylcarbinol with the Sulfhydryl Group. A New Reagent for Sulfhydryl Analysis . . . 127

Jacob Yashphe. Estimation of Micro Amounts of Urea and Carbamyl Derivatives . . . . . 143

Jacob Yashphe. Estimation of Micro Amounts of Carbamyl Phosphate . . . . . 154

J. S. Mort, D. K. K. Chong, and W. W.-C. Chain. Continuous

Spectrophotometric Assay of a Sepharose-Bound Enzyme and Its Use to Study Kinetics of Coupling of the Enzyme to Sepharose . . . . . 162

Sven Hammarstrom and Mats Hamberg. Steric Analysis of 3-, ω4-, ω3- and ω2-Hydroxy Acids and Various Alkanols by Gas-Liquid Chromatography . . . . . 169

D. H. Rammler, R. Haugland, and R. Shavitz. Hydrolytic Enzyme Substrates. I. Chemical Synthesis and Characterization 180

D. H. Rammler, R. Bilton, R. Haugland, and C. Parkinson. Hydrolytic Enzyme Substrates. II. A New Method for Measuring Periodate . . . . . 198

D. H. Rammler and C. Parkinson. Hydrolytic Enzyme Substrates. III. Phosphomonoesterase Substrates . . . . . 208

L. B. Jaques and A. Wollin. Identification and Quantitation of Heparins by Microelectrophoresis on Agarose Gel . . . . 219

Donald M. Kirschenbaum. A Compilation of Amino Acid Analysis of Proteins. III . . . . . 234

Julius Eyem and John Sjöquist. Analysis of Thiohydantoins from Amino Acids by Gas–Liquid Chromatography on Short Glass Capillary Columns . . . . . 255

Ronald E. Gots and Samuel P. Bessman. An Ultrasensitive Radioassay for Hexokinase . . . . . 272

M. D. Hatch. An Assay for PEP Carboxykinase in Crude Tissue Extracts . . . . . 280

N. C. Goodman, S. C. Gulati, R. Redfield, and S. Spiegelman. Room-Temperature Chromatography of Nucleic Acids on Hydroxylapatite Columns in the Presence of Formamide . . 286

Short Communications

Heng-Chun Li and David A. Felmly. A Rapid Paper Chromatographic Assay for Protein Kinase . . . . . 300

H. D. Söling and B. Volkmann. A Sensitive Assay for the Determination of Propionyl-CoA in Biological Material . 305

A. S. C. Ko and D. G. Smyth. The Use of Cyanate for the Determination of $NH_2$-Terminal Residues in *N*-Acylated Proteins . . . . . 311

Karl Blau. An Automated Fluorometric Method for the Determination of 5-Hydroxytryptamine in Extracts from Biological Materials . . . . . 314

Tadashi Inagami. Simultaneous Identification of PTH Derivatives of Histidine and Arginine by Thin-Layer Chromatography . . . . . 318

J. A. Harcourt and H. G. Klemperer. A Small Tissue Mincer for Muscle and Mammary Gland . . . . . 322

Pier Giorgio Pifferi and Luciano Baldassari. A Spectrophotometric Method for the Determination of the Catecholase Activity of Tyrosinase by Besthorn's Hydrazone . . . . . 325
A. Henville and G. Jenkin. A Simple and Cheap Remotely Operated System for the Iodination of Proteins . . . . . 336
Carleton T. Garrett, David S. Wilkinson, and Henry C. Pitot. Preparation of Ribonuclease-free DNase I and $\alpha$-Amylase . 342
J. Schmidt and M. A. Raftery. A Simple Assay for the Study of Solubilized Acetylcholine Receptors . . . . . 349
J. H. Nuner and W. J. Payne. Improved Cryostat for Spectrophotometry of Cytochromes . . . . . 355
Douglas Failla and Daniel V. Santi. A Simple Method for Quantitating Ligands Covalently Bound to Agarose Beads . 363
Masaru Kusaka and Michio Ui. A Microdetermination of [$^{14}$C] Lactate in Biological Fluids . . . . . 369
Arthur M. Felix and Manuel H. Jimenez. Rapid Fluorometric Detection for Completeness in Solid Phase Coupling Reactions 377
D. Hsu, P. Hoffman, and T. A. Mashburn, Jr. Acrylamide Gel Electrophoresis of Acid Glycosaminoglycans for the Study of Molecular Size Distribution . . . . . 382
Abraham Z. Reznick, Howard J. Allen, and Richard J. Winzler. Sequential Elution of Proteins in Small Volumes by Preparative Polyacrylamide Gel Electrophoresis . . . . . 395
M. K. Weibel, W. Dritschilo, H. J. Bright, and A. E. Humphrey. Immobilized Enzymes: A Prototype Apparatus for Oxidase Enzymes in Chemical Analysis Utilizing Covalently Bound Glucose Oxidase . . . . . 402
A. Dean Sherry, Edward R. Birnbaum, and Dennis W. Darnall. Proton Relaxation Studies in $H_2O$-$D_2O$ Mixtures. The Binding of Manganese(II) to Bovine Serum Albumin . . . . . 415
Bruce Morton. A Simplified High-Resolution Gradient Analysis System . . . . . 421
B. H. J. Hofstee. Hydrophobic Affinity Chromatography of Proteins . . . . . 430
Roy H. Hammerstedt. An Automated Method for ATP Analysis Utilizing the Luciferin–Luciferase Reaction . . . . . 449
Justin A. Zivin and John F. Snarr. An Automated Colorimetric Method for the Measurement of 3-Hydroxybutyrate Concentration . . . . . 456
Roger F. Martin and George S. Hodgson. Estimation of DNA, RNA and $^{125}$I- and $^{3}$H-Labeled DNA in the Same Sample . . 462
Davis W. Lamson and Takashi Yonetani. Evaporative Thin

Layer Chromatographic Separation of Hemin Dicarboxylic Acids . . . . . 470
A. R. Keen and N. J. Walker. Separation of Diacetyl, Acetoin, and 2,3-Butylene Glycol by Ion-Exchange Chromatography . 475
C. Damodaran, C. S. Ramadoss, and E. R. B. Shanmugasundaram. A Rapid Procedure for the Isolation, Identification and Estimation of Citrinin . . . . . 482
Charles Coutelle. A Simple, Rapid, and Sensitive Procedure for the Estimation of RNA in Erythroid Cells on Fritted Glass Filters . . . . . 489
G. Bondjers and S. Björkerud. Spectrophotometric Determination of Hydroxyproline in Connective Tissue on the Nanogram Level . . . . . 496
Charles R. Filburn and Jonathan Karn. An Isotopic Assay of Cyclic 3′,5′-Nucleotide Phosphodiesterase with Aluminum Oxide Columns . . . . . 505
T. H. Ji. Interference by Detergents, Chelating Agents, and Buffers with the Lowry Protein Determination . . . . . 517
Theodore R. Whitaker and Anthony J. Giorgio. A Direct Radioassay of Methylmalonyl-Coenzyme A Mutase Using Enzymatically Synthesized DL-[3-$^{14}$C] Methylmalonyl-CoA . 522
Pieter J. Van Niekerk. The Direct Determination of Free Tocopherols in Plant Oils by Liquid–Solid Chromatography . 533
R. A. Green, J. A. Foster, and L. B. Sandberg. Rapid Procedure for the Isolation of Polyfunctional Amino Acids in Elastin . 538
Mishrilal Jain, Freeman Sands, and R. W. Von Korff. Monoamine Oxidase Activity Measurements Using Radioactive Substrates . . . . . 542
Masako Maeda and Akio Tsuji. A Fluorophotometric Method for the Determination of Amino Acids by Using Pyridoxal and Zinc(II) Ion . . . . . 555
Elliott Richelson. A Microwell Assay Method for the Biochemical Study of Cultured Cells . . . . . 563
Jacob D. Peuler and Philip G. Passon. An Automated Assay for Brain Serotonin . . . . . 574
D. Sklan and P. Budowski. Conversion of Calciferols to Isotachysterols by Trifluoroacetic Acid . . . . . 584
N. Kirshner, D. Wallach, Y. Sharoni, and M. Schramm. Purification of Secretory Granules on a Urografin Gradient . . . 589
Z. Tamura, T. Nakajima, and T. Nakayama. Identification of Peptides with 5-Dimethylaminonaphthalenesulfonyl Chloride 595
A. C. Ward and E. A. Dawes. A Disk Assay for Poly-$\beta$-Hydroxybutyrate . . . . . 607

Juan-R. Mor, Andres Zimmerli, and Armin Fiechter. Automatic Determination of Glucose, Ethanol, Amino Nitrogen, and Ammonia. Cell Counting and Data Processing . . . . 614

Short Communications

E. Martin Gál and K. Patterson. Rapid Nonisotopic Assay of Tryptophan-5-Hydroxylase Activity in Tissues . . 625

Keith K. Schlender and Jerome A. Levin. A Simple and Sensitive Procedure for the Detection of Sucrose on Paper Chromatograms . . . . . 630

John C. Drach and Jean M. Novack. Some Simple Thin-Layer Chromatographic Systems for the Separation of Purines and Purine Nucleosides . . . . . 633

Frank M. DeFilippes. A Simple Assay for DNA Restriction Endonucleases . . . . . 637

J. J. Marshall and W. J. Whelan. Removal of $\alpha$-Glucosidase Impurity from Crystalline Sweet-Potato $\beta$-Amylase . . 642

Davis W. Lamson and Takashi Yonetani. Purification of Hematohemin IX by Column Chromatography . . . 647

Ryuichiro Hata and Yutaka Nagai. A Micro Colorimetric Determination of Acidic Glycosaminoglycans by Two Dimensional Electrophoresis on a Cellulose Acetate Strip 652

R. E. Sheridan, C. M. O'Donnell, and E. L. Pautler. The Determination of Submicrogram Quantities of DNA by Phosphorescence Analysis . . . . . 657

Paul M. Mehrle and Mary E. DeClue. Phenylalanine Determination in Fish Serum: Adaptation of a Mammalian Method to Fish . . . . . 660

Erratum . . . . . 662

Author Index . . . . . 663

Subject Index for Volume 52 will appear in the December issue as part of a cumulative index for the year 1973.